

**BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA**



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Order Instituting Rulemaking Regarding Policies,
Procedures and Rules for Development of Distribution
Resources Plans Pursuant to Public Utilities Code Section
769.

Rulemaking 14-08-013
(Filed August 14, 2014)

And Related Matters.

Application No. 15-07-002
Application No. 15-07-003
Application No. 15-07-006

**RESPONSE OF ENVIRONMENTAL DEFENSE FUND TO ADMINISTRATIVE LAW
JUDGE'S RULING INVITING COMMENTS ON INTEGRATION CAPACITY
ANALYSIS METHODOLOGIES, INTEGRATION CAPACITY ANALYSIS
WORKSHOP REPORT, LOCATIONAL NET BENEFITS ANALYSIS
METHODOLOGY, LOCATIONAL NET BENEFIT ANALYSIS WORKSHOP AND
DEMONSTRATION PROJECTS A AND B**

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I. INTRODUCTION

Pursuant to the Administrative Law Judge ruling issued on February 18,¹ Environmental Defense Fund (EDF) submits the following comments on Integration Capacity Analysis (ICA), Locational Net Benefit Analysis (LNBA), and Demonstration Projects A and B.

While EDF is pleased with the progress made so far in advancing ICA and LNBA methodologies, EDF reiterates its concern² that utility proposals to conduct case-by-case LNBA,

¹ *Administrative Law Judge’s Ruling Inviting Comments on Integration Capacity Analysis Methodologies, Integration Capacity Analysis Workshop Report, Locational Net Benefits Analysis Workshop Report, Locational Net Benefits Analysis Methodology, Locational Net Benefit Analysis Workshop and Demonstration Projects A and B*, Order Instituting Rulemaking Regarding Policies, Procedures and Rules for Development of Distribution Resources Plans Pursuant to Public Utilities Code Section 769 and Related Matters, R. 14-08-013, *et al.* (filed Feb. 18, 2016).

² *Comments of Environmental Defense Fund on Utility Locational Net Benefit Methodologies*, Order Instituting Rulemaking Regarding Policies, Procedures and Rules for Development of Distribution Resources Plans Pursuant to Public Utilities Code Section 769 and Related Matters, R. 14-08-013 at 5 (filed Jan. 26, 2016) (“Subjecting a given area to DRP examination is a form of special treatment, along with identifying locations as particularly meritorious of DER investment. Choosing one neighborhood over another without a proper consideration of all neighborhoods violates basic equity principles. This “preferential treatment” may be quite acceptable, if it is purposely and transparently working to remedy a public “bad,” create a public good, and/or reduce overall ratepayer costs”).

and request for offer (RFO)/contract-oriented solicitations will prevent engaging the full potential of market forces and associated innovation to create access to least-cost, best-fit and equitable energy solutions. Under the currently proposed framework, monopoly utilities will essentially direct procurements, rather than allowing innovators to rely on the same data to which utility engineers have access and propose superior solutions by, for instance, redefining the distribution system needs and possible solution sets.

As an example, where a utility RFO might be focused on peak-time generation capacity over a 20-year time period, a distributed energy resource (DER) provider may have a product that becomes cost-effective (and profitable) when its full set of values (e.g., peak and off-peak capacity; ancillary services; local flexible capacity) are considered over its expected (e.g., 50-year) production period. Furthermore, it may be that the most cost-effective way for reaching California's environmental goals via DERs is through geographically targeted programs or rates. Investor-owned utilities (IOUs) have demonstrated a strong track record in coordinating a preferred loading order on the bulk power system. It may prove even harder to do so at the grid edge.

As EDF has consistently recommended, the preferred approach to ushering in a fully functioning DER market is through the provision of distribution-level, marginal cost-based prices.³ This approach would also reflect California Public Utilities Commission (CPUC or Commission) policies underlying customer class revenue allocation and ratemaking. However, while we do not believe that a utility RFO represents the type of transparent process needed to

³ See, e.g., *Comments of Environmental Defense Fund on Utility Locational Net Benefit Methodologies*, Order Instituting Rulemaking Regarding Policies, Procedures and Rules for Development of Distribution Resources Plans Pursuant to Public Utilities Code Section 769 and Related Matters, R. 14-08-013, *et al.* at 6 (filed Jan. 26, 2016) (“an effective and equitable way to transparently communicate the potential value of DERs at a specific place and time is for the utilities to provide geographically transparent, marginal cost-based prices throughout their service territories”).

grow an innovative market with diverse solutions, if the Commission chooses to pursue such an approach it should make every effort to ensure that it is as open as possible – including bid evaluations by an independent third party - and identify means to transition to dynamic, price-based signals in lieu of RFOs.

EDF believes that neither the CPUC nor the IOUs should rush to adopt the ICA or LNBA methods to be used in Demonstrations A and B because they are not yet mature approaches. Instead, these methods, which underlie the Distribution Resources Plans (DRPs), should be implemented provisionally, pending insights from the demonstration projects, a continued examination of analytical methods commonly used in other similar realms, and market trends. In EDF's prior comments, we provided a list of improvements to be made to LNBA and other elements of the DRP that includes:

- dynamic integrated modeling between the LNBA, ICA and sourcing platforms;
- secure provision of grid data that can inform a broader set of DER solutions; and
- geographically transparent, marginal cost-based prices throughout the utility service territories.⁴

Development, testing, and absorption of new technologies and creation of new markets can take time,⁵ particularly in the case of the electricity industry, which is not known for the speed of its innovation. As part of DRP development, the Commission appropriately ordered the IOUs to undertake a series of pilots, whose purpose is, in part, to examine key methodological

⁴ *Comments of Environmental Defense Fund on the Distribution Resources Plan Roadmap Straw Proposal*, Order Instituting Rulemaking Regarding Policies, Procedures and Rules for Development of Distribution Resources Plans Pursuant to Public Utilities Code Section 769 and Related Matters, R. 14-08-013 *et al.* at 11-12 (filed Nov. 20, 2015); *Comments of Environmental Defense Fund on Utility Locational Net Benefit Methodologies*, Order Instituting Rulemaking Regarding Policies, Procedures and Rules for Development of Distribution Resources Plans Pursuant to Public Utilities Code Section 769, R. 14-08-013 *et al.* at 4,5 (filed Jan. 26, 2016).

⁵ Philip M. Roth, Stephen D. Ziman, and James D. Fine, *Tropospheric Ozone*, in *Keeping Pace with Science and Engineering: Case Studies in Environmental Regulation*, National Academy of Engineering (1993) at 79 (“although the time period associated with this process [regulatory system response to new information] is variable, it seems to range from 5 to 15 years”).

issues. These pilots should be allowed to mature in order to create the important insights that are expected of them, and to inculcate this knowledge into analytical approaches.

EDF does not believe there is sufficient information or enlightenment about potential future planning pathways to endorse any particular analytical method yet, but is optimistic that greater knowledge will be gleaned over time. In this respect, EDF supports the IOUs' proposed plans to move forward, with an expectation that utility staff will continue to evolve and improve the ICA and LNBA methodologies. Specific methodological improvements to be developed over the long term should include:

- Providing potential solutions providers with sufficient system data⁶ to allow for redefinition of distribution system needs as appropriate, thus creating more expansive, less expensive, solution sets. The current practice of relying on IOUs to define problems and control the solutions is not likely to result in least-cost outcomes. Utilities have to be mindful of yielding shareholder profits. The current perverse incentive systems for California's IOUs make traditional "steel-in-the-ground" rate-baseable investments more attractive than third party DER investments.
- Providing distribution system marginal cost information for all relevant nodes on the grid, and communicating this information saliently to customers and potential solutions providers. In this context, communicating distribution marginal cost information to ratepayers in the form of tariffs and incentives is akin to a customer-driven RFO. Particularly in the context of big data, as well as better visibility and controllability, the notion of "procuring" resources from customers and a dynamic market should become increasingly common and comfortable for DRP planners. In

⁶ System data refers to information that represents locational and temporal granularity at both the transmission and distribution levels, collectively representing the totality of the grid.

other words, IOUs must allow the data to enter the market unimpeded to form the basis for an organic, self-correcting market

- Making DRP modeling methods more interactively dynamic, as a way to become more comfortable with planning to “procure” DER resources and services in a distributed, market-based manner. That is, the ability of ICA, LNBA and source analytical platforms to be solved iteratively to find true DER optimization outcomes should be harnessed.
- Considering a “rates and programs first” methodology for capturing LNBA value after the initial estimates rather than assuming utility procurement will produce optimal results.

Through this lens, EDF provides responses to a select set of questions posed by the Commission.

II. DISCUSSION

EDF offers responses to Questions 1, 2, 3, 4, and 6 related to the LNBA, as well as Question 2 related to Demonstration Projects A and B, as posed by the ALJ Ruling.

A. Questions relating to the utility LNBA

1. How should the IOUs determine the cost of capacity upgrades that could be deferred by DERs for use in the LNBA? Do illustrative values or ranges need to be used in publicly-reported LNBA results to protect confidential or sensitive information?

Within the overall caveat that EDF prefers a more price-based dynamic approach than implied by the question, EDF believes cost data that informs the LNBA should generally adhere to standard utility practices for preparing construction cost estimates, including normal contingencies and “soft” costs. The IOUs should make available actual verifiable numbers, rather than illustrative values and ranges, including appropriately comprehensive data about grid needs to empower entrepreneurs to define new solutions. If confidentiality is a concern, data

could be anonymized, but not in a manner that dilutes its value to the market. In addition, protections can be put in place (such as use of non-disclosure agreements) to enable potential solutions providers to gain access to sensitive utility-controlled data. Security concerns could be alleviated by ensuring that access to sensitive data is restricted to a defined set of DER providers who have registered with the Commission and/or agree to abide by a certain code of conduct that prevents potential revealing of sensitive information.

The value of DERs should reflect not only the “book” value of a given resource, but also the ongoing services that it can provide. In the current context of incentives for the utilities to prefer rate-baseable infrastructure investments, the ability, for example, of rooftop photovoltaics to provide 25 years of energy AND extend the useful life of distribution infrastructure is not a financially attractive prospect for IOU shareholders. However, technology that may not have traditional market value can provide benefits to customers and the bulk transmission system. Therefore, when evaluating benefits it is critical to consider the full set of potential value streams, across the appropriate timeline, rather than the ability for the DER investment to meet only the discrete distribution system need as defined by the utility’s RFO.

2. Can DERs defer (or avoid) the need for power-quality (e.g., voltage support or frequency regulation) or reliability related distribution equipment in addition to capacity related distribution equipment? If so, provide an exhaustive list of this equipment and explain how the potential deferral of need should be valued in the LNBA.

3. What, if any, other local power-quality, reliability, avoided maintenance, conservation voltage, or other values can DERs provide that are not dependent on deferred equipment? How should those values be quantified and included in the LNBA?

EDF responds to questions 2 and 3 in one comment. As a general process point, EDF believes that a wider set of parties should be encouraged to participate in discussions over the proper approaches and potentially available technologies to avoid or reduce system costs. It is important to have an iterative, informed, process that includes a diverse range of stakeholders,

including those who reflect the customers' perspective, and an ability to value DER benefits beyond those described tightly within a utility RFO.

For example, the value placed on reliability, and willingness to pay for different reliability levels, varies significantly between individual customers and customer classes. These differences emerge from unique customer circumstances and preferences and capabilities, including access to technology. This has been soundly demonstrated by a long literature examining value-of-service, including as filed by the IOUs in various past regulatory proceedings. It is also evident from differences in distribution investments made by the utilities, and customers themselves, to ensure various reliability levels. Medical facilities and biotechnology companies want, and are willing to pay for, absolute reliability; farmers much less so.

This leaves us to observe that one-size-fits-all distribution solutions, particularly in an age of booming DER growth, will not provide the most efficient solution for ratepayers. Practically speaking, this understanding could play out in a variety of utility sourcing strategies or DER market functions. For example, where there exists an opportunity to cite storage on the customer's side of the meter to address a distribution system need (e.g. distributed, visible, dispatchable flexible energy source), there is likely to be a variety of financial arrangements that customers may be willing to accept in order to host a battery. In contrast to a customer who can glean additional value from the battery system (e.g., resiliency by islanding the battery with a solar PV generation station during a system-wide outage) and may therefore be willing to pay for a battery, other customers would need a financial sweetener, such as a rebate, to adopt the storage technology.

Put another way, some customers are paying for reliability they don't want, whereas others would gladly pay for high levels of reliability. Customers with access to storage, including potentially provided by their electric vehicle, may not wish to pay for gold standard reliability provided through the grid. Likewise, if given the option to select a reliability level associated with a range of prices, customers are likely to make a diverse set of choices. Assigning one reliability level to all customers is inherently inefficient, and with the emergence of DERs, no longer necessary.

Increasingly, DER solutions, such as storage and distributed generation, will provide low-cost options for customers to invest in maintaining higher levels of reliability. These differences in values as perceived by customers can be addressed through tariffs, or transactional arrangements potentially made possible through the DRP process.

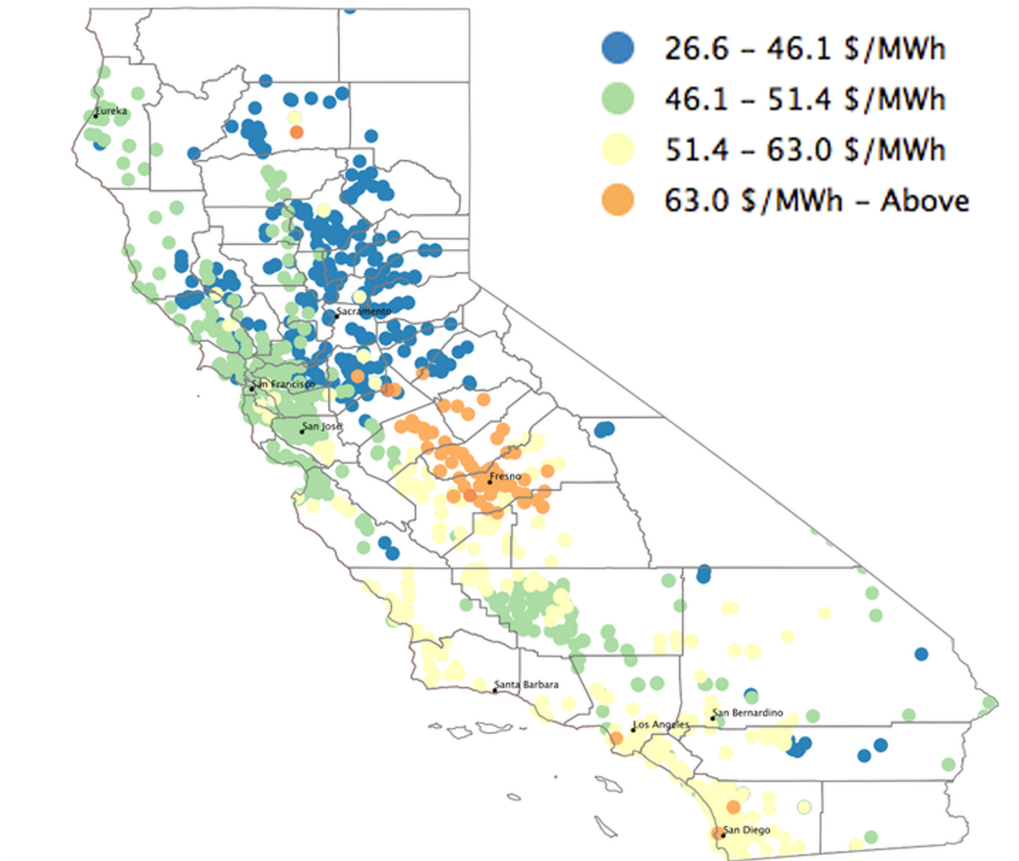
Vendors of DER products and services need actionable access to data, particularly related to the value of offering specific interventions at a given time and place. As EDF recommended in its introduction, this could largely be addressed through location-specific marginal costs and associated prices. Similarly, to responsibly acquire specific DERs, IOUs need detailed information about the capabilities and services, including voltage support where applicable, that a particular DER resource can provide.

Additional metrics that should be clearly evaluated and made available as part of the DRP process include:

- (1) The value of having access to many smaller resources, as opposed to a few larger ones. This may include the “option value” of deferring larger investments by proceeding with smaller ones, the “portfolio value” of managing risk through reliance on a greater diversity of assets, and the time value of money and management,

- associated with avoiding investments that may have simultaneously depreciating benefits. Said differently, there may be significant value in reducing the size of the “lumpiness” of distribution investments; small increments of investment can lead to more efficient solutions over the long term without compromising performance in the near term;
- (2) Proximity of a DER resource to a point on the grid where it’s services are needed; for example, generation resources located far from load are inherently less efficient than DERs that do not lose energy during long-distance transmission;
 - (3) The transfer of risks from the IOUs and/or ratepayers to third party providers or customers related to operations and maintenance of DERs through an appropriate value proposition, such as the utility providing an upfront rebate for avoided distribution system costs if and only if the DER operator can guarantee performance; and
 - (4) The ability to more finely target the geographic placement or timing of investments and the products that derive from those investments. To illustrate this point, we provide a figure of peak hour locational marginal energy prices at all California nodes in September, 2014.

California Avoided Costs



Geographic distribution of Locational Marginal Prices for the hour which contained the single highest Locational Marginal Price for September, 2014. Costs are in 2014 dollars.

Demand response resources can be found at many dispersed locations within a grid, but suitable locations for major generation stations near load are rare.

As well, an opportunity to inherently disperse a resource, such as aggregated demand response within a relevant planning area, can provide new strategies to manage grid challenges, such as distribution system power flow concerns.

4. Provide further information on feasibility screens. What factors would determine that DER-enabled deferral of a particular distribution investment is infeasible?

The current grid relies on the distribution system providing customers with a lifeline to the bulk system's massive generating stations. In the future, as DERs proliferate and begin to form microgrids, the lifeline to the central generation or transmission becomes less vital. Similarly, the notion that DERs will be valued only in terms of avoiding alternative investments does not recognize that the counterfactual (i.e., a traditional utility solution and the associated cost that the DER will avoid) is a memory but not current practice. That is, the DER solutions will become synonymous with utility solutions because either (a) the utility will choose the DER solution (that is also the customer-preferred and lower-cost solution) as routine practice so it can remain competitive, or (b) other energy service providers will do so, beating the incumbent utility on price and service. Therefore, the answer to this present question should become irrelevant.

While looking at the feasibility of a particular distribution investment is important, there are factors beyond feasibility that should be considered. Evaluating the needs of disadvantaged communities disproportionately affected by the problems that can be alleviated by smart DER investments is a critical part of building a green and equitable grid for Californians.

6. Identify the locational granularity used to evaluate the costs and benefits described in your approach (i.e., the line, section, feeder, multiple feeders, substation) if the proposal is different from the Guidance Ruling.

EDF believes that the appropriate level of locational granularity necessary is that which allows for clear evaluation and action by all those involved in the “market.” IOUs, third parties, and consumers need to be able to make informed investment and consumption decisions, and to take actions that make sense within the context of the routine cycles and responsibilities of energy users.

Regulators need to be able to ensure that utility expenditures are prudent, and that sufficient information is available to determine marginal costs, and associated customer class-specific revenue allocation and tariffs. Ratepayer advocates and environmental stakeholders need to be able to evaluate resulting environmental costs and benefits in terms of distributive equity and impact.

Information that forms the basis for the IOUs to make their decisions needs to be transparently available to consumers, third-parties, and regulators, and communicated in formats that allow for analysis and action by energy users and the smart technology they adopt. It is only in this way that DERs can fully realize their value to the grid and consumers.

At a minimum, it does not make sense to require greater geographic granularity than the IOUs currently have the ability to provide via their existing non-passive infrastructure (e.g. tap changers). However, some services may be provided by non-utility market participants via aggregation of distributed resources and the Commission should quantify the optimal geography for these aggregated services based on reasonable estimates of the number of market participants that can provide competitive pricing for these services. It does not, for example, make sense to create products requirements that would require utility-wide coverage. Neither does it make

sense to require penetration along every feeder segment if that would prevent a competitive market from materializing. For these reasons, the Commission should not rush to create markets but instead should evaluate them over time to insure they are right-sized for optimal outcome.

B. Questions relating to the utility Demonstration Projects A and B.

2. How should the success of the demonstration projects be evaluated? What metrics should be used?

EDF reiterates its introductory point that the success of the DRPs and the demonstration projects will largely depend on a careful balancing between moving forward expeditiously (to comply with justified timelines) and ensuring utility analyses and demonstration projects move forward with stakeholder input and learning-by-doing. Hurrying to the wrong endpoint or using the wrong means to get there will prevent or further delay much-needed proliferation and adoption of innovative grid solutions and the continued development of utility and stakeholder skill in planning the distribution system to host DERs. Additionally, this process needs to result in encouraging DER market development, including by enhancing utilities' understanding of DER's capabilities, and the tradeoffs between advanced capabilities, cost, and user complexity.

In order to accomplish a carefully planned DRP and ensure favorable outcomes, utilities must engage their ratepayers more expansively to assess the potential value of DER assets and incorporate this information into decision-making processes. In order to accomplish this important planning enhancement, utilities may need to consider further decentralizing their operations. For example, a field office in Fresno could more adequately explore how a smart A/C program can appeal to ratepayers, engage DER providers and benefit the grid than a planner sitting in San Francisco. This decentralization of the asset mapping and DER procurement, if proven viable, would be a natural step as Demonstrations A and B inform Demonstration C.

An analogy can be drawn here to organic farming – while the methods necessary for successful organic farming may require greater manpower (i.e., in this instance, more people on the ground in different locations that can get a better sense of the needs in different locations), it also requires less investment in dangerous chemicals (i.e., allowing DERs to offset the need for more infrastructure and prevent gold-plating the grid with unnecessary investments). Similarly, while the IOUs may invest more staff time in processes to develop distributed solutions, it will pay off in the form of better outcomes, particularly for the environment and future generations.

III. CONCLUSION

In conclusion, EDF reiterates the following points:

- Marginal cost-based distribution level pricing is EDF's preferred solution for the future, but as an interim measure, RFOs need to be conducted in a way that is as transparent and efficient as possible;
- Utilities need to hear the perspective of other stakeholders to effectively frame problems and create innovative solutions;
- The success of DRPs and demonstration projects will depend on balancing the need to move forward expeditiously with ensuring that projects take stakeholder input and lessons learned into consideration as part of the development of planning and regulatory approaches;
- The Commission and utilities need to consider and evaluate the needs of disadvantaged communities;
- Values should reflect ongoing benefits, and the benefits derived from placement of a DER at a particular location; and
- System data should be available to third party solution providers in order to create a market with more expansive, innovative solutions.

EDF thanks the Commission for the opportunity to provide comments on the LNBA and ICA, as well as Demonstration Projects A and B and looks forward to continued engagement.

Respectfully signed and submitted on March 3, 2016.

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